AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-233. (canceled).

234. (currently amended): A computer system for recommending an optimal treatment protocol for treating cancer using drugs, for an individual, said system interfacing with the computer and said system further comprising:

a cancer system model;

a treatment protocol generator for generating a plurality of treatment protocols for treating cancer using drugs;

a system model modifier, wherein ~~said the~~ the said system model modifier is adapted to modify said cancer system model based on parameters specific to the individual; and

a selector adapted to select an optimal treatment protocol from said plurality of treatment protocols based on the modified system model.

235. (previously presented): The system of claim 234 wherein the system model further comprises:

a process model of cancer development; and

a treatment model that is adapted to model the effects of treating cancer with drugs, including chemotherapy.

236. (original): The system of claim 235 wherein said process model incorporates a distribution of cycling cells and quiescent cells.

237. (previously presented): The system of claim 235 where a tumor cell cycle is divided into at least four compartments G1, S, G2 and M and a quiescent stage is denoted by G0, wherein each of said four compartments is further subdivided into sub-compartments and an ith sub-compartment representing cells of age I in the corresponding compartment, wherein the system is adapted to ensure that cells entering a compartment always enter a first sub-compartment of the compartment.

238. (currently amended): The system of claim 237 wherein the model is adapted to trace development of cancer cells using a predetermined set of parameters by calculating a number of cells in each sub-compartment using stepwise equations.

239. (currently amended): The system of claim 238 wherein the system is adapted to use a probability vector ~~is used~~ to determine a fraction of cells that leaves any sub-compartment in a compartment to move to a first sub-compartment of the next compartment.

240. (previously presented): The system of claim 238 where the system includes a set of control functions that are adapted to uniquely determine an outcome of every single step, wherein said control functions comprise age of cells, state of a current population and associated environment.

241. (currently amended): The system of claim 238 wherein the system comprises a model representing a tumor, the model comprising a combination of a plurality of homogeneous groups of cells, each of said homogeneous groups of cells representing a similarly behaving group of cells distributed between all the cell-cycle compartments.

242. (previously presented): The system of claim 241, wherein the system is adapted to calculate in each step, a number of cells in each sub-compartment of each compartment of each group according to factors including a previous state, parameters of tumor, tumor current microenvironment and drug concentration.

243. (original): The system of claim 242 where spatial structure of the tumor is included in the model.

244. (currently amended): The system of claim 243, wherein the system is adapted to incorporate pharmacokinetics and pharmacodynamics, cytostatic effects, cytotoxic effects, and other effects ~~on cell disintegration~~ of anticancer drugs on cell disintegration.

245. (previously presented): The system of claim 244 wherein the system is adapted to incorporate a dose-limiting toxicity into the model.

246.(currently amended): The system of claim 234, wherein, said parameters specific to the individual comprise parameters related to tumor dynamics, patient specific drug ~~pharmocokinetics~~ pharmacokinetics, pharmacodynamics and dynamics of dose-limiting toxicity

in host tissues.

247. (currently amended): The system of claim 246, wherein said parameters related to tumor dynamics comprise age, weight, gender, percentage of limiting healthy cells, desired length of treatment protocol, previous reaction to treatment, molecular markers, genetic markers, pathologic ~~specifics~~ markers and cytologic ~~specifics~~ markers.

248-465. (canceled).

466. (previously presented): A computer-implemented method for recommending an optimal treatment protocol for treating cancer using drugs for an individual, said method comprising:

creating a cancer system model;

enumerating a plurality of treatment protocols for treating cancer using drugs;

modifying the system model based on parameters specific to the individual;

selecting an optimal treatment protocol from said plurality of treatment protocols based on the modified system model; and

recommending said optimal treatment.

467. (previously presented): The method of claim 466 wherein the system model further comprises:

a process model of cancer development; and

a treatment model that models the effects of treating cancer with drugs, including chemotherapy.

468. (original): The method of claim 467 wherein said process model incorporates a distribution of cycling cells and quiescent cells.

469. (original): The method of claim 467 where a tumor cell cycle is divided into at least four compartments G1, S, G2 and M and a quiescent stage is denoted by G0, wherein each of said four compartments is further subdivided into sub-compartments and an ith sub-compartment representing cells of age I in the corresponding compartment, wherein cells entering a compartment always enter a first sub-compartment of the compartment.

470. (currently amended): The method of claim 469 wherein the model traces development of cancer cells using a predetermined set of parameters by calculating a number of cells in each sub-compartment using stepwise equations.

471. (currently amended): The method of claim 470 wherein a probability vector is used to determine a fraction of cells that leaves any sub-compartment in a compartment to move to a first sub-compartment of the next compartment.

472. (currently amended): The method of claim 470 where a set of control functions uniquely determines an outcome of every single step, wherein said control functions comprise

age of cells, state of a current population and associated environment.

473. (currently amended): The method of claim 470 wherein a tumor is ~~modelled~~ modeled as a combination of a plurality of homogeneous groups of cells, each of said homogeneous groups of cells representing a similarly behaving group of cells distributed between all the cell-cycle compartments.

474. (currently amended): The method of claim 473, wherein in each step, a number of cells in each sub-compartment of each compartment of each group is calculated according to factors including a previous state, parameters of tumor, current tumor ~~current~~ microenvironment and drug concentration.

475. (original): The method of claim 474 where spatial structure of the tumor is included in the model.

476. (currently amended): The method of claim 475, wherein pharmacokinetics, pharmacodynamics, cytotoxic effects, cytostatic effects and other effects ~~on cell disintegration~~ of anticancer drugs on cell disintegration are incorporated into the model.

477. (currently amended): The method of claim 476, wherein a dose-limiting toxicity is incorporated into the model.

478. (currently amended): The method of claim 466, wherein, said parameters specific to the individual comprise parameters related to tumor dynamics, patient specific drug pharmacokinetics, pharmacodynamics and dynamics of dose-limiting toxicity in host tissues.

479. (currently amended): The method of claim 478, wherein said parameters related to tumor dynamics comprise age, weight, gender, percentage of limiting healthy cells, desired length of treatment protocol, previous reaction to treatment, molecular markers, genetic markers, pathologic ~~specifics~~ markers and cytologic ~~specifics~~ markers.

480-509. (canceled).